

REMARKS

Reconsideration and withdrawal of the rejections set forth in the Office Action dated November 28, 2008 are respectfully requested.

I. **Amendments**

Claim 1 is amended to recite one or more of the biomolecules is a vesicle capable of specifically binding a test agent. Basis for this amendment can be found in original claim 5.

Claim 8 is amended to correct an obvious typographical error.

Claim 5 is canceled.

No new matter is added by way of these amendments.

II. **Rejections Under 35 U.S.C. § 102**

Claims 1-4, 9, 11 and 12 were rejected under 35 U.S.C. §102(b) as allegedly anticipated by Boxer et al. U.S. Patent No. WO98/23948.

In view of the amendments to claim 1, Applicants respectfully request withdrawal of the rejection over Boxer et al. under 35 U.S.C. §102(b).

III. **Rejections under 35 U.S.C. §103**

Claims 1-4 and 9-12 were rejected under 35 U.S.C. §103 as allegedly obvious over Boxer et al. in view of Cornell et al. (U.S. Patent No. 5,874,316), Arnold et al. (U.S. Patent No. 5,310,648), or Bayerl et al. (U.S. Patent No. 6,051,372).

Claims 1-7 and 9-12 were rejected under 35 U.S.C. §103 as allegedly obvious over Boxer et al. in view of both Boukobza et al. (*J Phys Chem*, 105:12165-12170, 2001) and Niemeyer (DE 19902391, abstract).

Claims 1-4, 8, 9, 11, and 12 were rejected under 35 U.S.C. §103 as allegedly obvious over Boxer et al. in view of Shen et al. (U.S. Publication No. 2003/0148335).

These rejections are respectfully traversed.

A. The Present Claims

Claim 1 relates to an array of separated lipid bilayers. The array includes one or more lipids derivatized with an oligonucleotide having a surface region specific sequence and at least one biomolecule anchored to at least one of the lipid bilayer expanses through a complementary oligonucleotide sequence capable of specifically hybridizing with the surface region specific oligonucleotide sequence in that expanse, such that the biomolecule is anchored to that expanse. One or more of the biomolecules is a vesicle capable of specifically binding a test agent.

B. The Cited References

BOXER ET AL. relate to a surface detector array formed of a substrate having a surface defining a plurality of distinct bilayer-compatible surface regions separated by one or more bilayer barrier regions. The bilayer-compatible surface regions may further include a selected biomolecule covalently or non-covalently attached to a lipid molecule (see page 4 line 32 through page 5, line 2). Examples of biomolecules include polynucleotides and nucleic acids (see page 5, lines 4-5 and page 16, line 4). The bilayer may be derivatized with groups or compounds to create a surface having the desired surface exemplified by a ligand bound to the surface of the lipid by attachment to surface lipid components (see page 11, line 32 through page 12, line 2). Specific high-affinity molecular interactions may be employed to link biomolecules to a supported layer (see page 18, lines 7-8).

CORNELL ET AL. relate to receptor binding of an analyte.

ARNOLD ET AL. describe an imprinted matrix, which exhibits selective binding interactions through metal chelates.

BAYERL ET AL. describe two-dimensional patterning of a three-dimensional surface by a template molecule.

BOUKOBZA ET AL. describe an immobilization technique using biotin-avidin interaction. Large unilamellar lipid vesicles (LUV) are attached to a glass-supported lipid bilayer through the biotin-avidin binding interaction. The LUV includes a single biomolecule encapsulated inside the LUV for characterization of the biomolecule.

NIEMEYER ET AL. states reversible, parallel, site-specific immobilization of macromolecules on a solid phase comprising using nucleic acids as immobilization-mediating reagents is new.

C. Analysis

According to the M.P.E.P. § 2143, "to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art references (or references when combined) must teach or suggest all the claim limitations."

1. Rejection over Boxer et al. in view of Cornell et al., Arnold et al., or Bayerl et al.

The combination of references fail to show or suggest an array of separated lipid bilayers including at least one biomolecule anchored to a lipid bilayer expanse through complementary oligonucleotides, where one or more of the biomolecules is a vesicle capable of specifically binding a test agent.

2. Rejection over Boxer et al. in view of Boukobza et al. and Niemeyer et al.

The combination of Boxer et al., Boukobza et al. and Niemeyer fail to show or suggest an array of separated lipid bilayers including at least one biomolecule anchored to a lipid bilayer expanse through complementary oligonucleotides, where one or more of the biomolecules is a vesicle capable of specifically binding a test agent.

Boxer et al. make no mention of the biomolecule being a vesicle.

Boukobza et al. teach using biotin-avidin affinity for binding biomolecules to surface-tethered lipid vesicles. However, as seen in Figure 1 on page 12166, the liposome of Boukobza et al. includes a protein encapsulated within the liposome. Boukobza et al. makes no mention of a vesicle capable of specifically binding a test agent.

The abstract of Niemeyer et al. makes no mention of at least one biomolecule anchored to a lipid bilayer expanse through complementary oligonucleotide sequences much less a plurality of lipid bilayer expanses containing one or more lipids derivatized

with an oligonucleotide having a surface region specific oligonucleotide. Niemeyer *et al.* instead relate to "site-specific immobilization of macromolecules on a solid phase." Nor does the abstract make any mention of vesicles.

3. Rejection over Boxer *et al.* in view of Shen *et al.*

The combination of references fail to show or suggest an array of separated lipid bilayers including at least one biomolecule anchored to a lipid bilayer expanse through complementary oligonucleotides, where one or more of the biomolecules is a vesicle capable of specifically binding a test agent.

As the references, alone or in combination, fail to teach or suggest all the claim limitations, the Examiner has failed to establish a *prima facie* case of obviousness. Accordingly, Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 103.

IV. Conclusion

In view of the foregoing, the claims pending in the application comply with the requirements of 35 U.S.C. § 102 and patentably define over the applied art. A Notice of Allowance is, therefore, respectfully requested. If the Examiner has any questions or believes a telephone conference would expedite prosecution of this application, the Examiner is encouraged to call the undersigned at (650) 590-1939.

Respectfully submitted,
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